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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,430

08/18/2005

Olaf Pichler

167/04/Heuer

3270

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7590

06/19/2009

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NEW YORK, NY 10016-2223

EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

06/19/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 23, 25-28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Graves (U.S. Patent No. 7,212,739).

Regarding claims 23, Graves teaches an optical cross-connect, comprising: a first plurality of input channels for through data traffic (reference numeral 22 in Figure 2); a second plurality of output channels for the through data traffic (reference numeral 28 in Figure 2); a plurality of first optical switching matrices (reference numeral 12a-12m in Figure 2) comprising a first group of input ports (i.e. reference numerals 24 in Figure 2 with the exception of inputs 32 on lines K from element 14 in Figure 2) which are connected to the input channels of the cross-connect, and a first group of output ports (i.e. reference numerals 26 in Figure 2 with the exception of outputs 30 on lines K to element 14 in Figure 2) which are connected to the output channels of the cross-connect, for interconnecting the input channels and the output channels; each of the first switching matrices being operative for switching communication signals at a same wavelength assigned to the first optical switching matrices (column 4 line 49 – column 5 line 17); the first optical switching matrices having a second group of output ports (i.e. outputs 30 on lines K to element 14 in Figure 2) and a second group of input ports (i.e. inputs 32 on lines

Art Unit: 2613

K from element 14 in Figure 2); each signal shaping unit being operative for regenerating the optical signal received at its input port (i.e. the input wavelengths are formed or produced anew at a different wavelength and output); a group of one or more signal shaping units formed as wavelength converters (reference numeral 14 in Figure 2), each signal shaping unit having an input connected to the second group of output ports (i.e. via outputs 30 on lines K to element 14 in Figure 2) and an output connected to the second group of input ports (i.e. via inputs 32 on lines K from element 14 in Figure 2); and switching elements (i.e. the internal switching mechanisms within switching matrices 12a-12m and 14 in Figure 2) for selectively connecting the output or the input of each of the signal shaping units to different ones of several of the second group of input ports or second group of output ports, respectively, of the first optical switching matrices.

Regarding claim 25, Graves teaches the optical cross-connect of claim 23, and at least one second optical switching matrix (reference numeral 62 in Figure 3) for selectively connecting the second group of output ports of the first optical switching matrices to one of the wavelength converters.

Regarding claim 26, Graves teaches the optical cross-connect of claim 25, and at least a third optical switching matrix (reference numeral 60 in Figure 3) for selectively connecting the wavelength converters to one of the second group of input ports of the first optical switching matrices.

Regarding claim 27, Graves teaches the optical cross-connect of claim 23, in that each input channel is connected to the first optical switching matrices via a wavelength demultiplexer

(reference numeral 16a-16n in Figure 2) and/or the first optical switching matrices are connected to each output channel via a wavelength multiplexer.

Regarding claim 28, Graves teaches the optical cross-connect of claim 23, and comprising inputs and/or outputs (reference numeral 30, 32 in Figure 2) connected to the second group of input or output ports of the first optical switching matrices, for branching the through data traffic.

Regarding claim 30, Graves teaches the optical cross-connect of claim 23, in that the first group of input ports (reference numeral 22 in Figure 2) are connected to the input channels (reference numeral 24 in Figure 2) and/or the first group of output ports are connected to the output channels, respectively, without a switching matrix being inserted in between.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Sharratt (Patent No. US 7,136,586 B2).

Regarding claim 24, Graves teaches the optical cross-connect of claim 23, in that each signal shaping unit is operative for shaping a communication signal (inherent in the wavelength converting switch 14 of Figure 2), but differs from the claimed invention in that Graves fails to specifically teach that the shaping occurs for only one communication signal. However, Sharratt teaches that this concept is well known in the art (Figure 4). One skilled in the art would have

Art Unit: 2613

been motivated to shape only one communication signal via each individual shaping unit in order to regenerate individual components of a WDM signal (column 13 lines 35-57 of Sharratt).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to shape only one communication signal.

Regarding claim 31, Graves differs from the claimed invention in that Graves fails to specifically teach that each signal shaping unit comprises a photodiode for optical-to-electrical conversion, an electrical circuit connected thereto for impulse shaping and amplification, and a fixed wavelength laser diode driven by an electrical signal of said electrical circuit for regenerating the optical communication signal. However, Sharratt teaches that such signal shaping units are well known in the art (Figure 4). One skilled in the art would have been motivated to employ this type of signal shaping unit as the signal shaping unit in Graves in order to allow selection of simply pure optical amplification or regenerative amplification (column 13 lines 35-57 of Sharratt). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a signal shaping unit such as that taught by Sharratt in the apparatus of Graves.

5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graves.

Regarding claim 29, Graves differs from the claimed invention in that Graves fails to specifically teach that each wavelength converter has a wavelength-tunable transmitter part. However, the use of wavelength tunable transmitter parts in wavelength converters is well known in the art and Official Notice is given to that effect. One skilled in the art would have been motivated to employ tunable transmitter parts in the wavelength converters of Graves in order to allow for conversion of any input wavelength to any output wavelength. Therefore, it

would have been obvious to one skilled in the art at the time the invention was made to include tunable transmitter parts in the wavelength converters of Graves.

Response to Arguments

6. Applicant's arguments filed 04/07/09 have been fully considered but they are not persuasive.

Applicant argues that the newly amended claim language distinguishes the claimed invention from the cited prior art. However, the examiner disagrees. As noted in the amended office action, the previously cited prior art continues to read on the claimed invention. Although applicant contends that nothing in graves teaches that the wavelength converting switch can regenerate optical signals, the examiner notes that input optical signals in Graves are regenerated at least in the sense that they are formed or produced anew, but at a different wavelength. Furthermore, applicant's requirement that regeneration of an optical signal is limited to the same wavelength at the input and the output of the regenerating device is overly restrictive since regeneration can occur in a variety of manners including regeneration of a signal at a different wavelength. Therefore, when given the broadest reasonable interpretation, Graves continues to meet the limitations of the claimed invention.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2613

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/509,430

Page 8

Art Unit: 2613

/Agustin Bella

Primary Examiner

Art Unit 2613